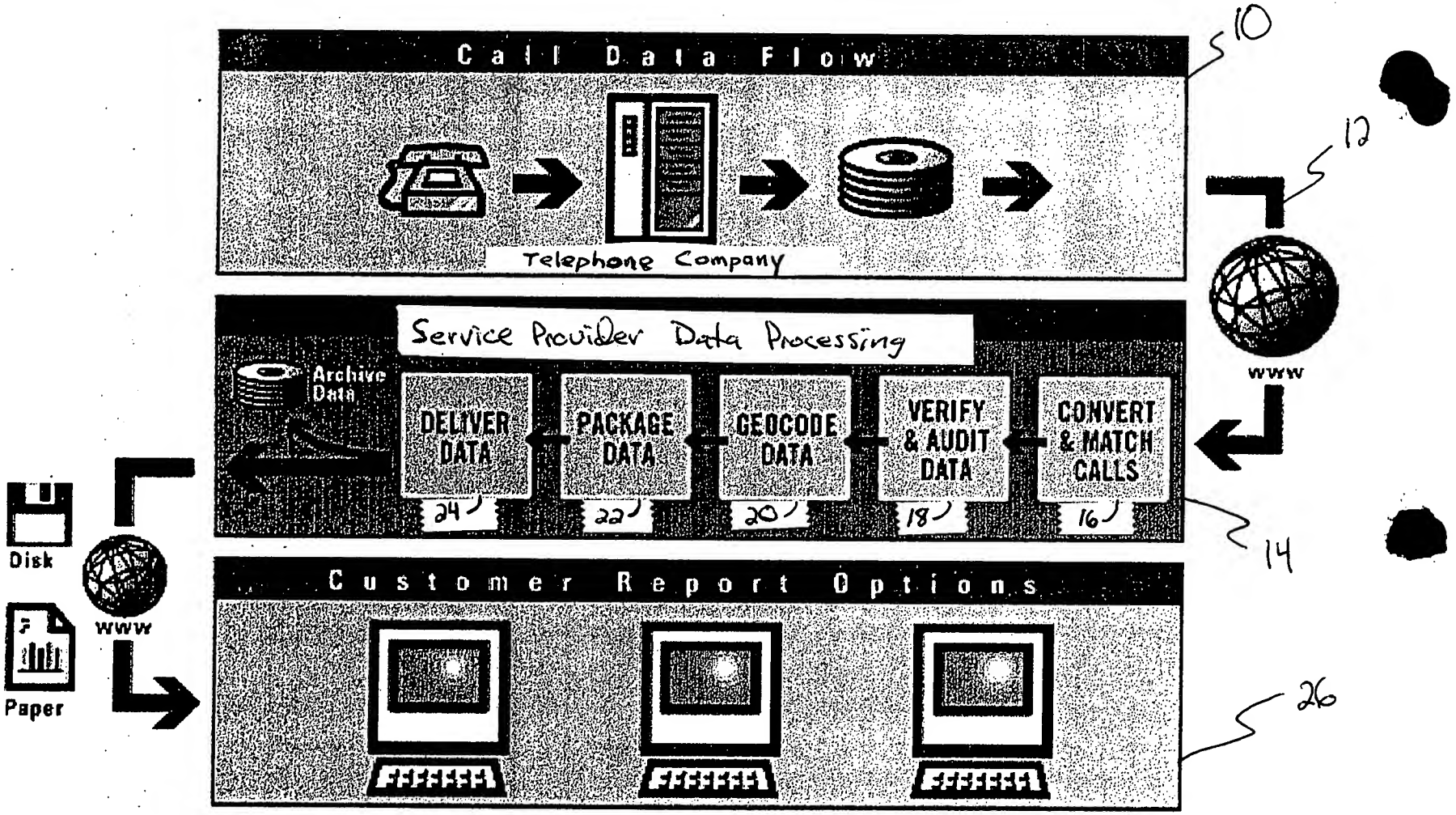

Call Data Flow
10
12
Telephone Company
www
Service Provider Data Processing
Archive Data
DELIVER DATA
PACKAGE DATA
GEOCODE DATA
VERIFY & AUDIT DATA
CONVERT & MATCH CALLS
24
22
20
18
16
14
Disk
Paper
www
Customer Report Options
26

Figure 1

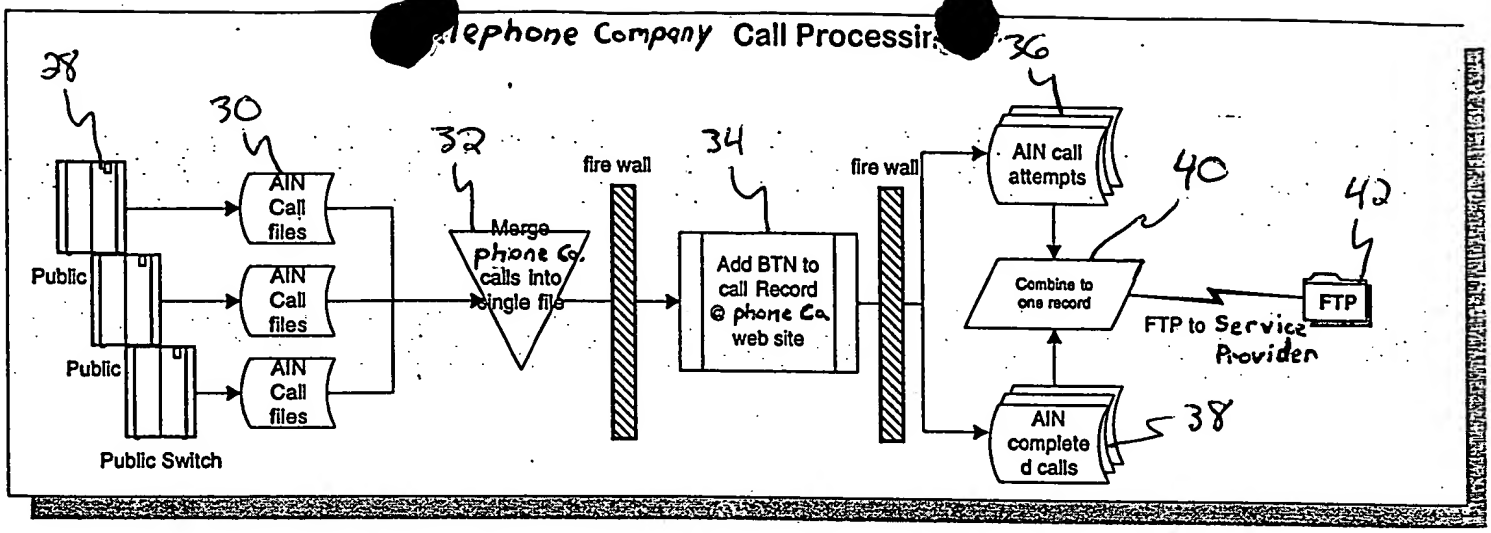

Telephone Company Call Processing
28
30
32
34
36
38
40
42
Public
Public
Public Switch
AIN Call files
AIN Call files
AIN Call files
Merge phone Co. calls into single file
fire wall
Add BTN to call Record @ phone Co. web site
fire wall
AIN call attempts
Combine to one record
FTP
FTP to Service Provider
AIN complete d calls

Fig. 2

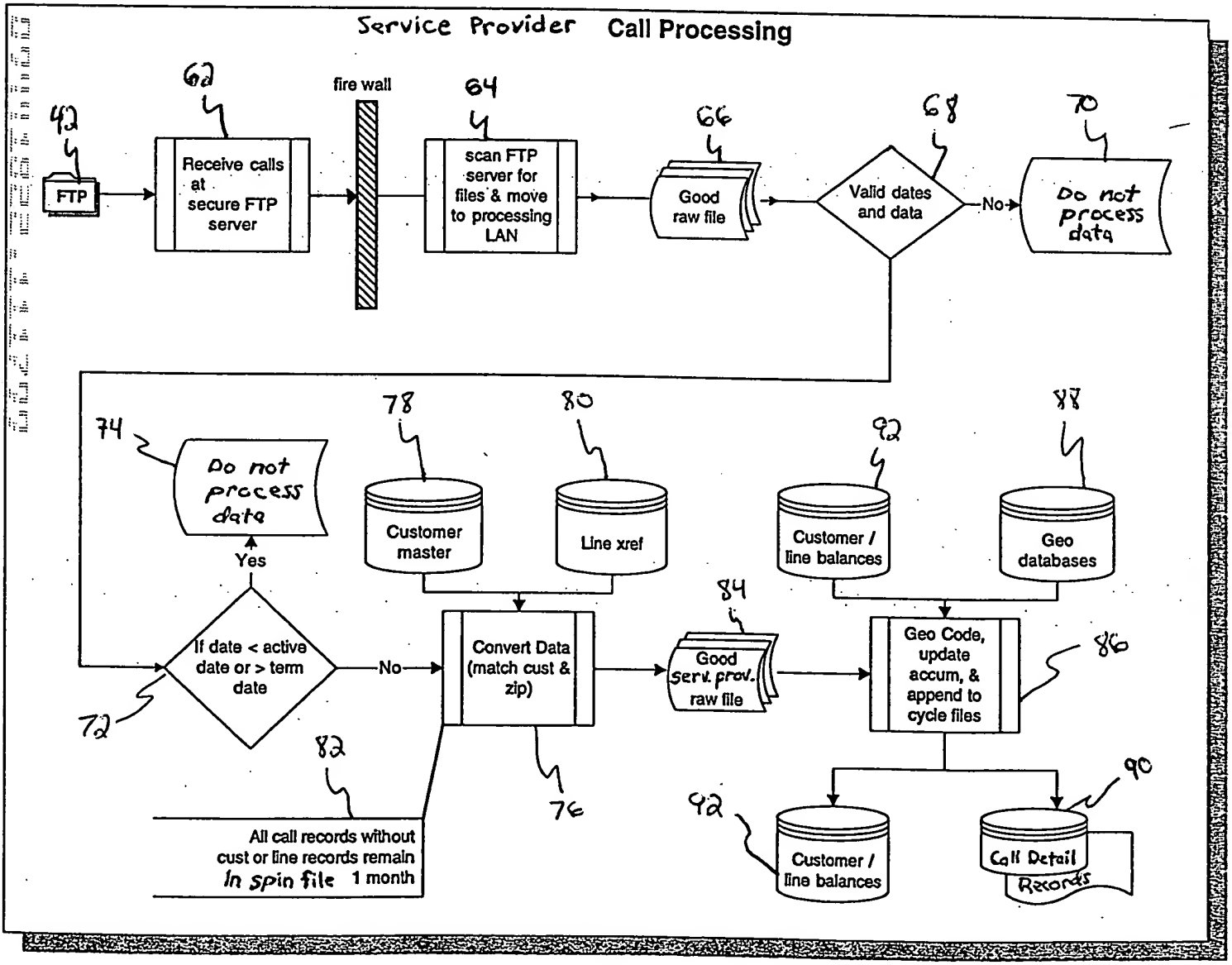

Service Provider Call Processing
42
FTP
62
Receive calls at secure FTP server
fire wall
64
scan FTP server for files & move to processing LAN
66
Good raw file
68
Valid dates and data
No
70
Do not process data
74
Do not process data
Yes
78
Customer master
80
Line xref
92
Customer / line balances
88
Geo databases
If date < active date or > term date
No
72
Convert Data (match cust & zip)
76
84
Good serv. prov. raw file
Geo Code, update accum, & append to cycle files
86
82
All call records without cust or line records remain In spin file 1 month
92
Customer / line balances
90
Call Detail Records

Fig. 4

| RBOC-ID | Vencode | Cmr_rate | study type | vendor type | btn | line | time | date | calling party | name | zip | calltype | response type | duration | sec | err code | busycd | exception | busycause |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 85006cf5c016 | 11 | cmr_sample_c | 0 | 0 | 105072881861 | 105072527500 | 6050700 | 819981007 | 105078679181 | nr | 9559233503 | CONTINUE | 1 | 1 | 40 | 0 | 0 | 0 | |

44 46 48 50 52 54 56 58 60

Fig. 3

# Cycle Processing

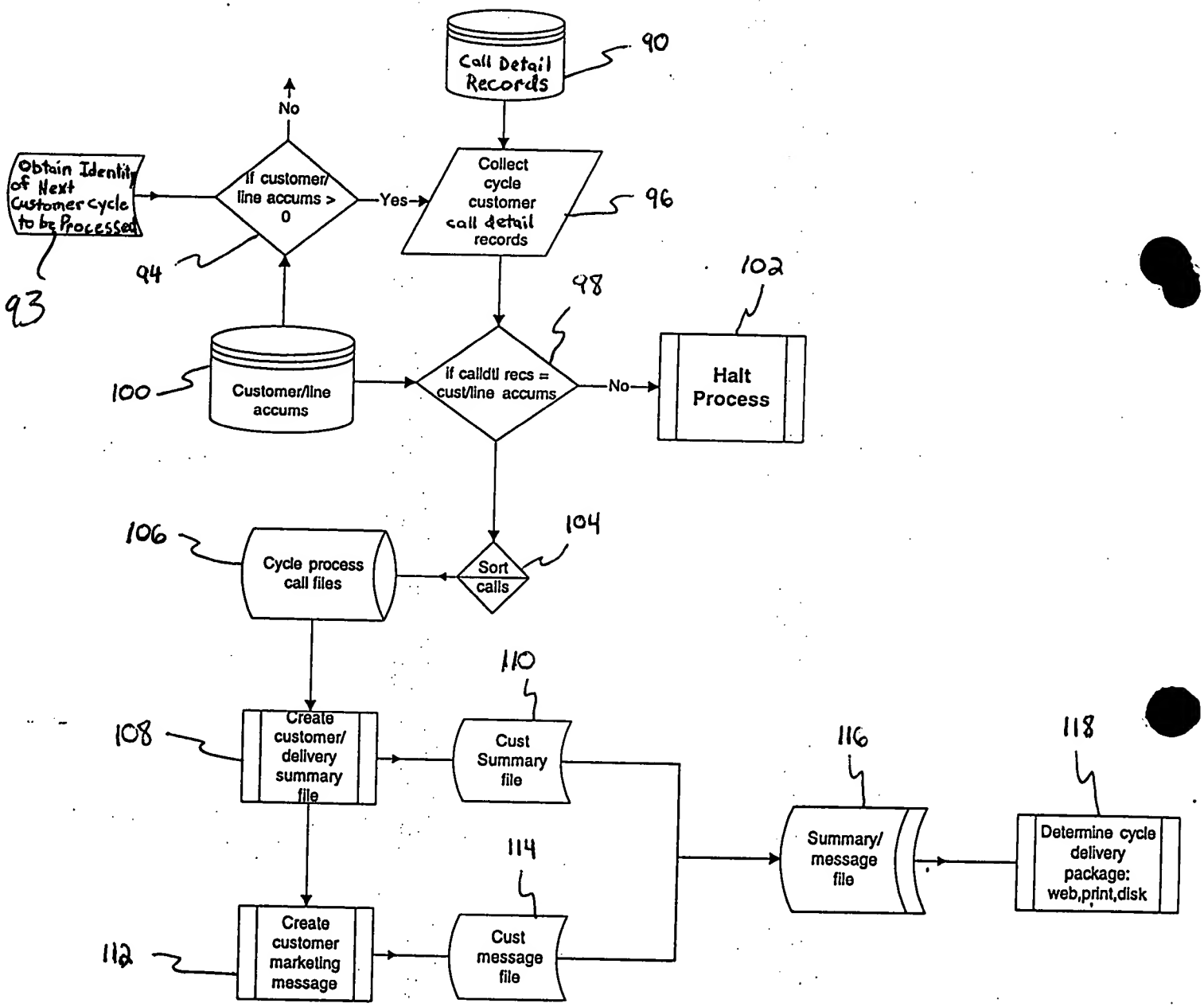



Fig. 5

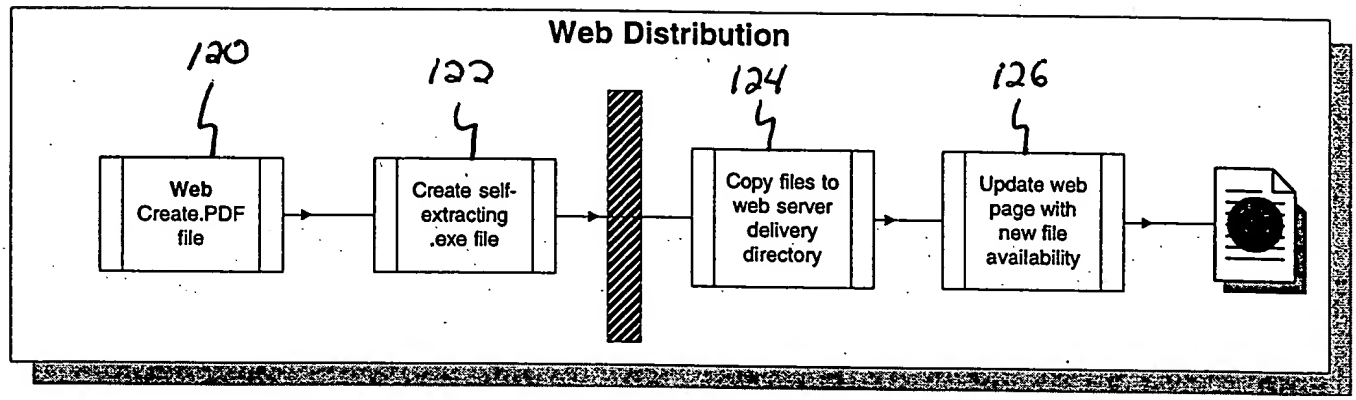

Web Distribution
120
122
124
126
Web Create.PDF file
Create self-extracting .exe file
Copy files to web server delivery directory
Update web page with new file availability

Fig. 6

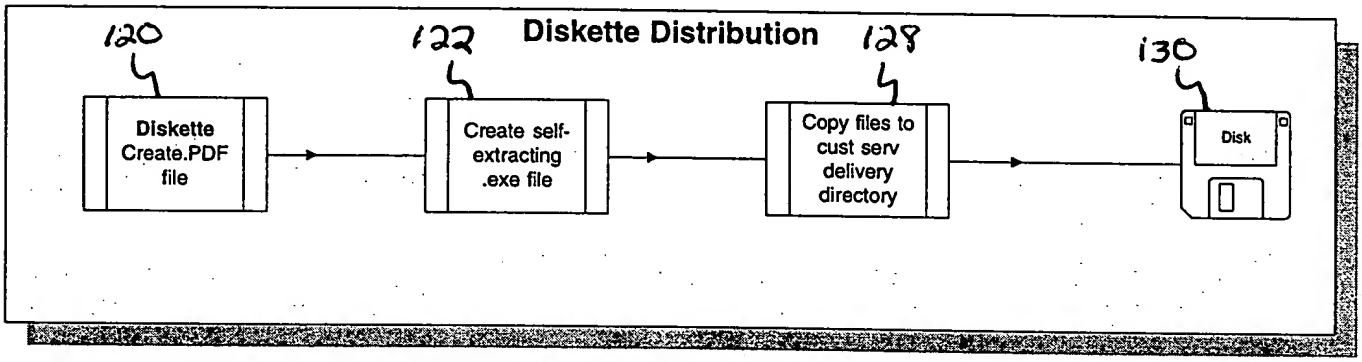

Diskette Distribution
120
122
128
130
Diskette Create.PDF file
Create self-extracting .exe file
Copy files to cust serv delivery directory
Disk

Fig. 7

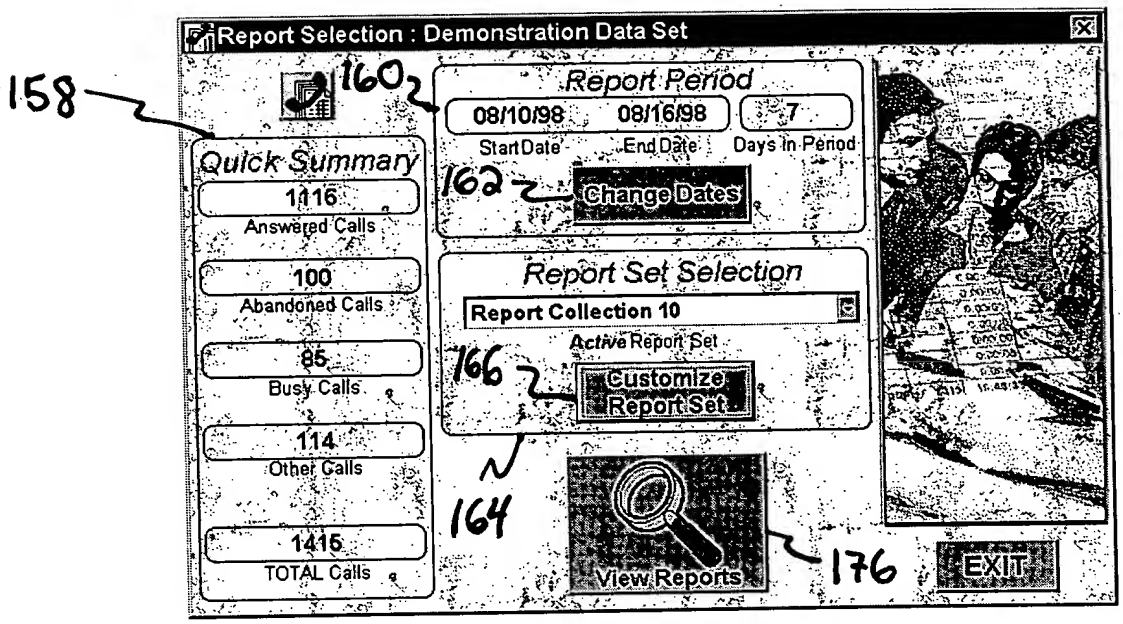
| 132 | 134 | 136 | 138 | 140 | 142 | 144 | 146 | 148 | 150 | 152 | 154 | 156 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FILE_ID | CDATE | CTIME | DN | CPN | CALL_TYPE | CALL_DISP | CALL_STAT | CALL_DUR | XACTION | CPN_NAME | POSTALCODE | LONGITUDE | LATITUDE | Q_BYTES | MISC |
| | 8/22/98 | 04:18:15 PM | 5135551212 | 9375787400 | I | 2 | 0 | 0 | | unavailable | | -84.193714 | 39.759868 | S | |
| | 8/22/98 | 04:18:36 PM | 5135551212 | 8122562495 | I | 0 | 1 | 260 | | unavailable | | -85.384117 | 38.733633 | S | |
| | 8/22/98 | 04:32:30 PM | 5135551212 | 7405458420 | I | 0 | 1 | 200 | | unavailable | | -82.961757 | 40.232652 | S | |
| | 8/22/98 | 06:39:51 PM | 5135551212 | 1111111111 | I | 0 | 1 | 360 | | unavailable | | 0.000000 | 0.000000 | U | |
| | 8/23/98 | 08:55:34 AM | 5135551212 | 5555555555 | I | 0 | 1 | 2730 | | unavailable | | 0.000000 | 0.000000 | U | |
| | 8/23/98 | 09:09:07 AM | 5135551212 | 1111111111 | O | 0 | 1 | 240 | | unavailable | | 0.000000 | 0.000000 | U | |
| | 8/23/98 | 09:52:46 AM | 5135551212 | 1111111111 | I | 1 | 0 | 0 | | unavailable | | 0.000000 | 0.000000 | U | |
| | 8/23/98 | 12:22:41 PM | 5135551212 | 1111111111 | I | 0 | 1 | 230 | | unavailable | | 0.000000 | 0.000000 | U | |
| | 8/23/98 | 12:48:28 PM | 5135551212 | 5133901888 | I | 0 | 1 | 110 | | unavailable | | -84.519930 | 39.102459 | S | |
| | 8/23/98 | 01:41:09 PM | 5135551212 | 6066207160 | I | 0 | 1 | 220 | | unavailable | | -84.519930 | 39.102459 | S | |
| | 8/23/98 | 01:53:10 PM | 5135551212 | 9378565488 | I | 0 | 1 | 100 | | unavailable | | -84.364952 | 39.623529 | S | |
| | 8/23/98 | 02:17:51 PM | 5135551212 | 1111111111 | I | 2 | 0 | 0 | | unavailable | | 0.000000 | 0.000000 | U | |
| | 8/23/98 | 03:32:58 PM | 5135551212 | 1111111111 | I | 0 | 1 | 50 | | unavailable | | 0.000000 | 0.000000 | U | |
| | 8/23/98 | 03:47:34 PM | 5135551212 | 5136598931 | I | 3 | 0 | 0 | | unavailable | | -84.519930 | 39.102459 | S | |
| | 8/23/98 | 05:30:56 PM | 5135551212 | 7658471638 | I | 0 | 1 | 220 | | unavailable | | -84.941571 | 40.049073 | S | |
| | 8/23/98 | 07:16:25 PM | 5135551212 | 9372740967 | I | 0 | 1 | 70 | | unavailable | | -84.225906 | 39.790287 | S | |
| | 8/23/98 | 11:09:44 PM | 5135551212 | 1111111111 | I | 0 | 1 | 2720 | | unavailable | | 0.000000 | 0.000000 | U | |
| | 8/21/98 | 09:06:43 AM | 5135551212 | 6066354067 | O | 0 | 1 | 50 | | unavailable | 410019720 | -84.419803 | 38.880692 | A | |
| | 8/20/98 | 09:17:34 AM | 5135551212 | 6065895650 | I | 0 | 1 | 4400 | | unavailable | 410058211 | -84.722085 | 39.028344 | A | |
| | 8/19/98 | 08:33:35 AM | 5135551212 | 6068697769 | I | 2 | 0 | 0 | | unavailable | 410059751 | -84.737297 | 39.075182 | A | |
| | 8/19/98 | 09:05:04 AM | 5135551212 | 6066879769 | I | 0 | 1 | 2180 | | unavailable | 410059751 | -84.737297 | 39.075182 | A | |
| | 8/19/98 | 05:22:59 PM | 5135551212 | 6066896779 | I | 0 | 1 | 2850 | | unavailable | 410059751 | -84.737297 | 39.075182 | A | |
| | 8/21/98 | 08:55:45 PM | 5135551212 | 6066722444 | I | 0 | 1 | 280 | | unavailable | 410069608 | -84.369442 | 38.787168 | A | |
| | 8/17/98 | 11:59:37 AM | 5135551212 | 6069218116 | O | 0 | 1 | 760 | | unavailable | 410111135 | -84.530487 | 39.082738 | A | |
| | 8/20/98 | 02:43:02 PM | 5135551212 | 6062198116 | I | 0 | 1 | 3450 | | unavailable | 410111135 | -84.530487 | 39.082738 | A | |
| | 8/21/98 | 04:59:46 PM | 5135551212 | 6062198116 | I | 1 | 0 | 0 | | unavailable | 410111135 | -84.530487 | 39.082738 | A | |
| | 8/18/98 | 10:21:30 AM | 5135551212 | 6062916544 | I | 0 | 1 | 1610 | | unavailable | 410111160 | -84.529001 | 39.082483 | A | |
| | 8/19/98 | 09:26:36 AM | 5135551212 | 6069214564 | I | 0 | 1 | 710 | | unavailable | 410111160 | -84.529001 | 39.082483 | A | |

Fig. 8

# Geocoding logic hierarchy

| | Criterion | | | | Value |
|---|---|---|---|---|---|
| | CASE 1 | | | | |
| IF | 9 digit zip exists in zip field | | & exists in -> | 9 digit zip DB | A |
| | otherwise | 9 digit zip (1st 5 digits) | exists in -> | 5 digit zip DB | B |
| | otherwise | 9 digit zip (1st 3 digits) | exists in -> | 3 digit zip DB | C |
| | otherwise | npanxx of calling # field | exists in -> | npanxx DB | D |
| | otherwise | npa of calling # field | exists in -> | nap DB | E |
| | otherwise | use special value indicating unknown origin | | | F |
| | CASE 2 | | | | |
| otherwise, IF | 6, 7, or 8 digit zip exists in zip field (bad data) | | | | |
| | AND | npanxx of calling # field | exists in -> | npanxx DB | G |
| | otherwise | npa of calling # field | exists in -> | nap DB | H |
| | otherwise | use special value indicating unknown origin | | | I |
| | CASE 3 | | | | |
| otherwise, IF | 5 digit zip exists in zip field | | & exists in -> | 5 digit zip DB | J |
| | otherwise | 5 digit zip (1st 3 digits) | exists in -> | 3 digit zip DB | K |
| | otherwise | npanxx of calling # field | exists in -> | npanxx DB | L |
| | otherwise | npa of calling # field | exists in -> | nap DB | M |
| | otherwise | use special value indicating unknown origin | | | N |
| | CASE 4 | | | | |
| otherwise, IF | < 5 digit zip exists in zip field (bad data) | | | | |
| | AND | npanxx of calling # field | exists in -> | npanxx DB | P |
| | otherwise | npa of calling # field | exists in -> | nap DB | Q |
| | otherwise | use special value indicating unknown origin | | | R |
| | CASE 5 | | | | |
| otherwise, IF | 0 or null exists in zip field (no zip) | | | | |
| | AND | npanxx of calling # field | exists in -> | npanxx DB | S |
| | otherwise | npa of calling # field | exists in -> | nap DB | T |
| | otherwise | use special value indicating unknown origin | | | U |

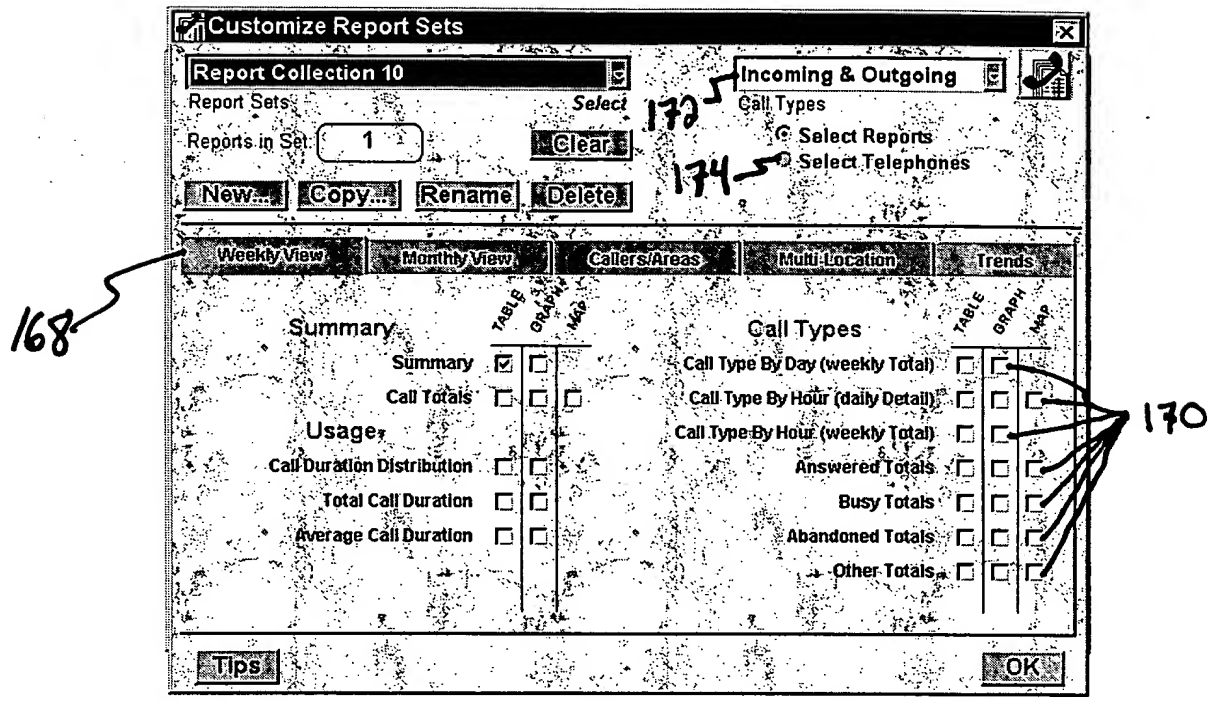
Table 1


Report Selection : Demonstration Data Set
158
160
Quick Summary
1116
Answered Calls
100
Abandoned Calls
85
Busy Calls
114
Other Calls
1415
TOTAL Calls
Report Period
08/10/98
08/16/98
7
Start Date
End Date
Days in Period
162
Change Dates
Report Set Selection
Report Collection 10
Active Report Set
166
Customize Report Set
164
View Reports
176
EXIT

Appendix A

| August 1998 | | | | | | |
|---|---|---|---|---|---|---|
| Mon | Tue | Wed | Thu | Fri | Sat | Sun |
| 27 | 28 | 29 | 30 | 31 | 1 | 2 |
| 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 10 | 11 | 12 | * ACTIVE * Available | | 15 | 16 |
| 17 | 18 | 19 | 20 Available | 21 | 22 | 23 |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 1 | 2 | 3 | 4 | 5 | 6 |

Appendix B


Customize Report Sets
Report Collection 10
Report Sets
Select
Reports in Set 1
Clear
New...
Copy...
Rename
Delete
Incoming & Outgoing
Call Types
Select Reports
Select Telephones
172
174
168
Weekly View
Monthly View
Callers/Areas
Multi-Location
Trends
Summary
TABLE
GRAPH
MAP
Summary
Call Totals
Usage
Call Duration Distribution
Total Call Duration
Average Call Duration
Call Types
Call Type By Day (weekly Total)
Call Type By Hour (daily Detail)
Call Type By Hour (weekly Total)
Answered Totals
Busy Totals
Abandoned Totals
Other Totals
170
Tips
OK

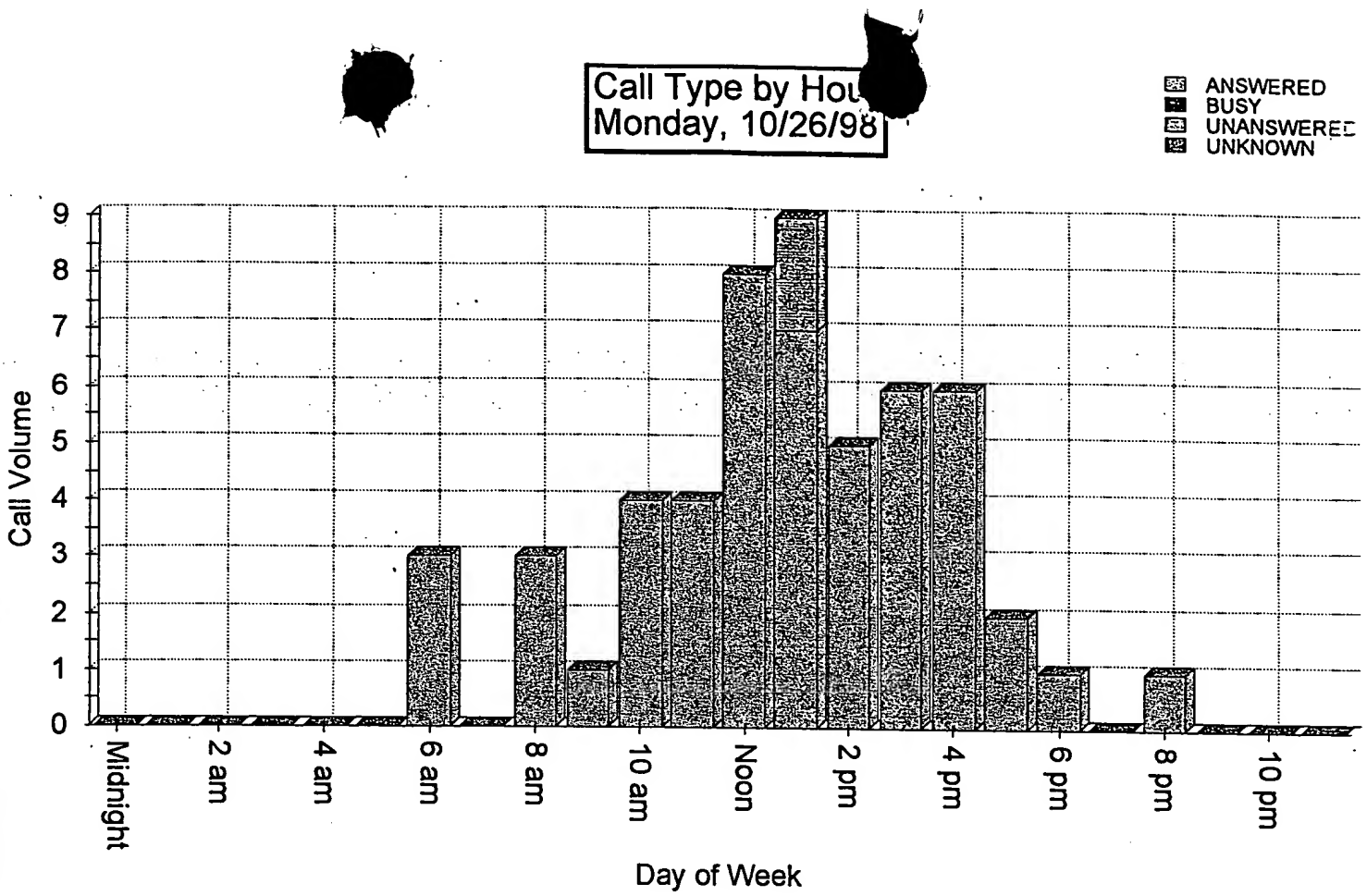
Appendix C

## New ZIP Codes

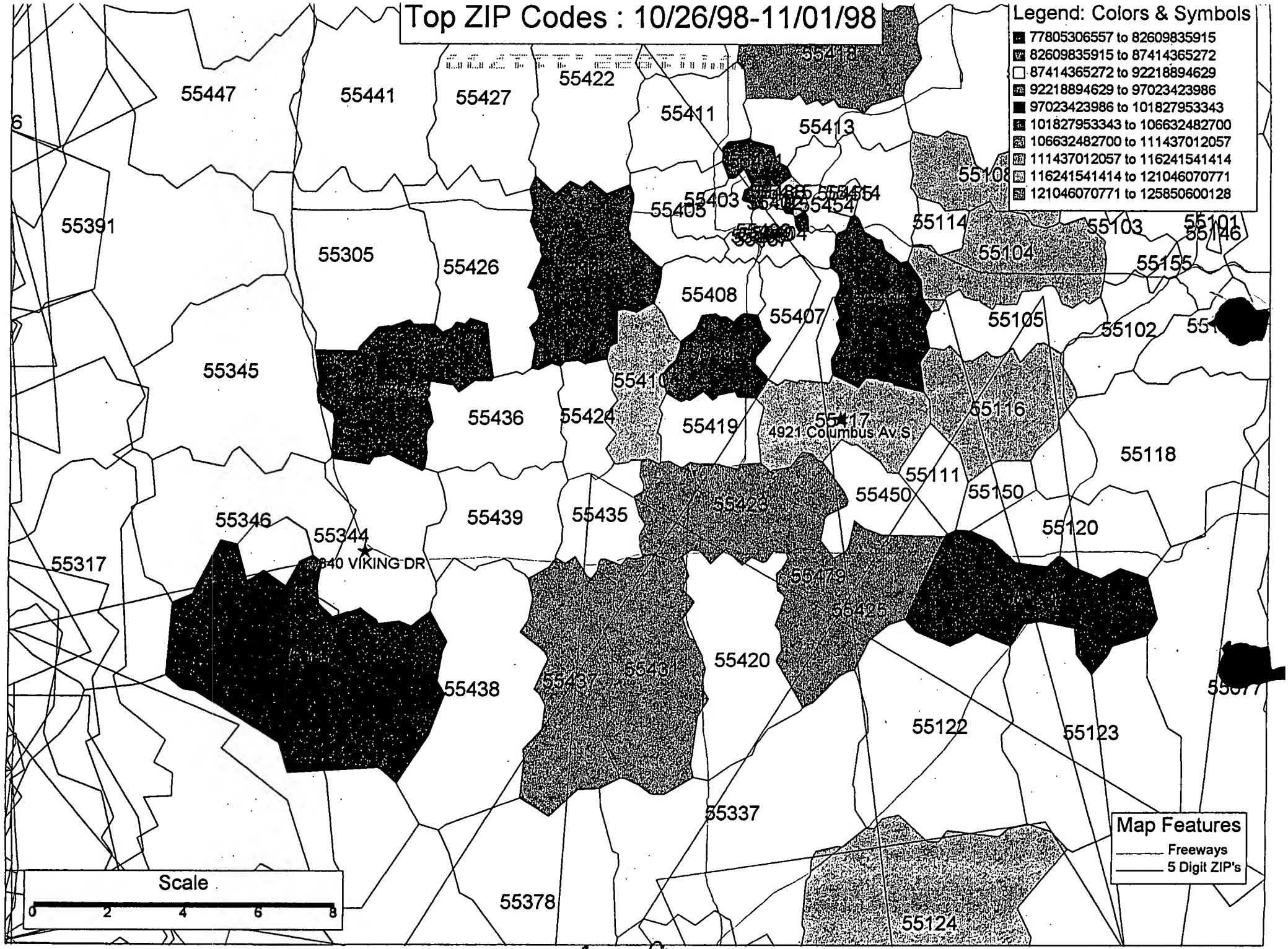
New ZIP codes discovered in the current date range ranked by answered call count.

| Zip Code | State | Call Count | First Call Date & Time | Last Call Date & Time | Total Duration |
|---|---|---|---|---|---|
| 55402 | MN | 11 | 10/26/98 11:07:00 AM | 10/30/98 02:46:00 PM | 0:27:40.0 |
| 55416 | MN | 11 | 10/26/98 12:11:00 PM | 10/29/98 02:37:00 PM | 0:11:25.0 |
| 84111 | UT | 6 | 10/26/98 09:56:00 AM | 10/28/98 02:15:00 PM | 0:31:12.0 |
| 55343 | MN | 6 | 10/26/98 01:38:00 PM | 10/30/98 11:57:00 AM | 0:14:28.0 |
| 56304 | MN | 5 | 10/26/98 06:43:00 PM | 10/28/98 05:47:00 PM | 0:44:51.0 |
| 85012 | AZ | 4 | 10/27/98 05:15:00 PM | 10/29/98 05:48:00 PM | 0:06:14.0 |
| 55347 | MN | 4 | 10/26/98 06:51:00 AM | 10/28/98 02:43:00 PM | 0:02:31.0 |
| 98191 | WA | 3 | 10/26/98 10:34:00 AM | 10/29/98 06:09:00 PM | 0:16:07.0 |
| 55104 | MN | 3 | 10/26/98 11:48:00 AM | 10/27/98 11:30:00 AM | 0:03:12.0 |
| 55415 | MN | 3 | 10/27/98 05:34:00 PM | 10/30/98 01:03:00 PM | 0:02:17.0 |
| 80132 | CO | 3 | 10/26/98 12:57:00 PM | 10/26/98 02:57:00 PM | 0:01:24.0 |
| 55425 | MN | 2 | 10/26/98 04:25:00 PM | 10/28/98 03:56:00 PM | 0:06:05.0 |
| 98188 | WA | 2 | 10/28/98 01:26:00 PM | 10/28/98 01:29:00 PM | 0:05:34.0 |
| 83204 | ID | 2 | 10/30/98 11:09:00 AM | 10/30/98 11:09:00 AM | 0:04:48.0 |
| 55431 | MN | 2 | 10/26/98 03:59:00 PM | 10/30/98 09:44:00 AM | 0:03:39.0 |
| 55124 | MN | 2 | 10/27/98 02:08:00 PM | 10/27/98 02:10:00 PM | 0:03:07.0 |
| 55364 | MN | 2 | 10/27/98 03:50:00 PM | 10/27/98 03:50:00 PM | 0:00:46.0 |
| 55437 | MN | 2 | 10/28/98 05:11:00 PM | 10/29/98 03:25:00 PM | 0:00:29.0 |
| 55305 | MN | 1 | 10/27/98 03:20:00 PM | 10/27/98 03:20:00 PM | 0:09:54.0 |
| 85283 | AZ | 1 | 10/28/98 05:44:00 PM | 10/28/98 05:44:00 PM | 0:07:33.0 |
| 85024 | AZ | 1 | 10/27/98 05:41:00 PM | 10/27/98 05:41:00 PM | 0:04:06.0 |
| 80202 | CO | 1 | 10/30/98 01:36:00 PM | 10/30/98 01:36:00 PM | 0:03:35.0 |
| 55118 | MN | 1 | 10/30/98 08:37:00 AM | 10/30/98 08:37:00 AM | 0:03:17.0 |
| 97401 | OR | 1 | 10/29/98 02:13:00 PM | 10/29/98 02:13:00 PM | 0:02:32.0 |
| 80206 | CO | 1 | 10/28/98 10:09:00 AM | 10/28/98 10:09:00 AM | 0:02:02.0 |
| 68144 | NE | 1 | 10/28/98 03:14:00 PM | 10/28/98 03:14:00 PM | 0:01:51.0 |
| 55391 | MN | 1 | 10/28/98 05:36:00 PM | 10/28/98 05:36:00 PM | 0:01:48.0 |
| 55011 | MN | 1 | 10/26/98 02:30:00 PM | 10/26/98 02:30:00 PM | 0:01:47.0 |
| 85255 | AZ | 1 | 10/27/98 05:55:00 PM | 10/27/98 05:55:00 PM | 0:01:22.0 |
| 99216 | WA | 1 | 10/30/98 11:29:00 AM | 10/30/98 11:29:00 AM | 0:01:11.0 |
| 97204 | OR | 1 | 10/26/98 02:08:00 PM | 10/26/98 02:08:00 PM | 0:00:57.0 |
| 55113 | MN | 1 | 10/26/98 03:59:00 PM | 10/26/98 03:59:00 PM | 0:00:43.0 |
| 68102 | NE | 1 | 10/26/98 12:05:00 PM | 10/26/98 12:05:00 PM | 0:00:41.0 |
| 98004 | WA | 1 | 10/30/98 03:32:00 PM | 10/30/98 03:32:00 PM | 0:00:41.0 |
| 55422 | MN | 1 | 10/26/98 11:12:00 AM | 10/26/98 11:12:00 AM | 0:00:20.0 |
| 55102 | MN | 1 | 10/27/98 11:47:00 AM | 10/27/98 11:47:00 AM | 0:00:07.0 |
| 55427 | MN | 1 | 10/26/98 04:09:00 PM | 10/26/98 04:09:00 PM | 0:00:06.0 |
| 55404 | MN | 1 | 10/26/98 04:26:00 PM | 10/26/98 04:26:00 PM | 0:00:05.0 |
| 55420 | MN | 1 | 10/26/98 10:05:00 AM | 10/26/98 10:05:00 AM | 0:00:03.0 |

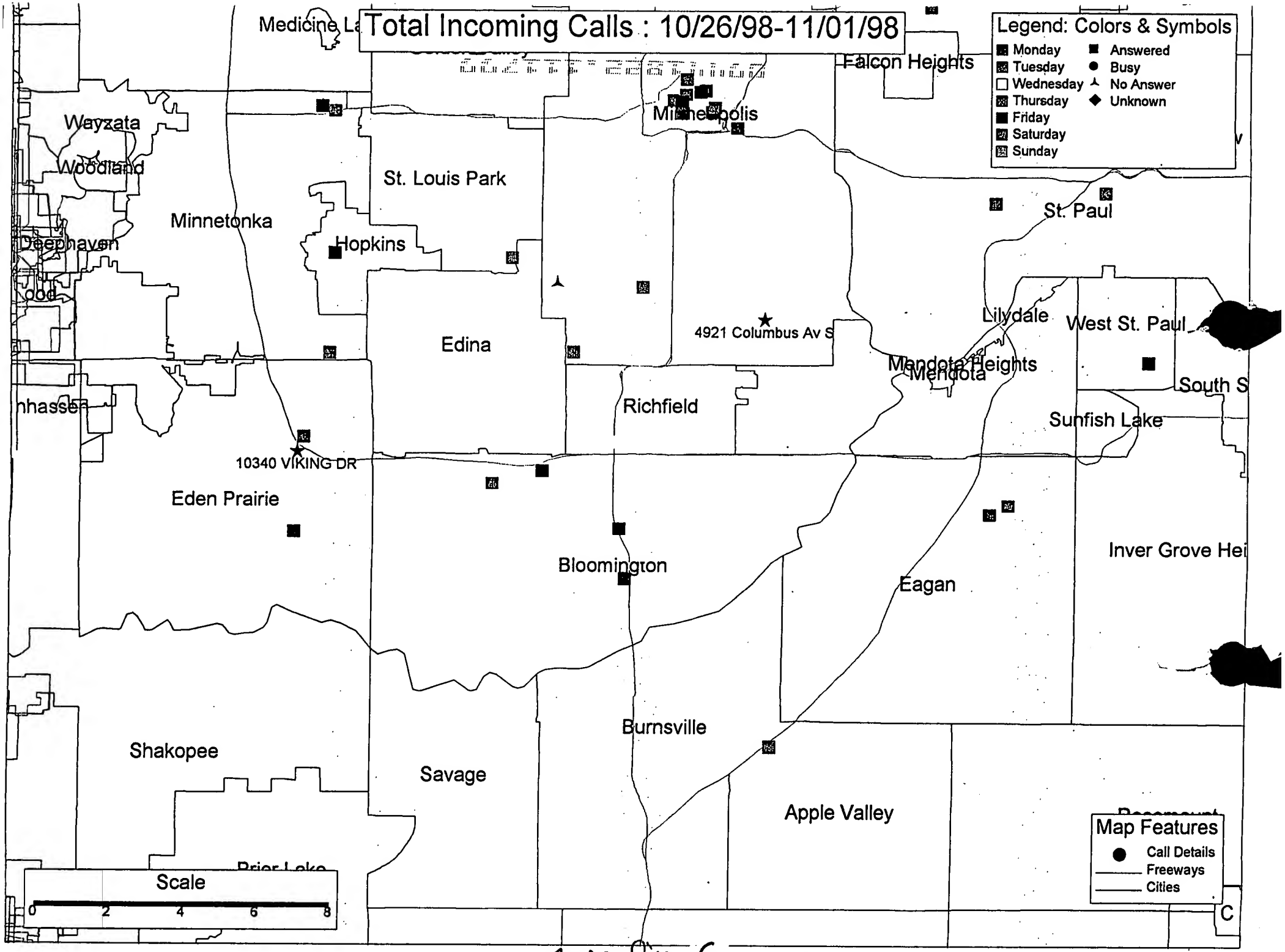
Appendix D


Call Type by Hou
Monday, 10/26/98
ANSWERED
BUSY
UNANSWERED
UNKNOWN
Call Volume
0
1
2
3
4
5
6
7
8
9
Midnight
2 am
4 am
6 am
8 am
10 am
Noon
2 pm
4 pm
6 pm
8 pm
10 pm
Day of Week

Appendix E


Top ZIP Codes : 10/26/98-11/01/98
Legend: Colors & Symbols
77805306557 to 82609835915
82609835915 to 87414365272
87414365272 to 92218894629
92218894629 to 97023423986
97023423986 to 101827953343
101827953343 to 106632482700
106632482700 to 111437012057
111437012057 to 116241541414
116241541414 to 121046070771
121046070771 to 125850600128
55447
55441
55427
55422
55411
55413
55391
55305
55426
55403
55405
55408
55407
55114
55103
55104
55155
55101
55146
55105
55102
55345
55410
55436
55424
55419
55417
4921 Columbus Av S
55116
55118
55111
55450
55150
55423
55439
55435
55346
55344
840 VIKING DR
55317
55479
55425
55120
55420
55438
55437
55431
55122
55123
55337
55378
55124
Map Features
Freeways
5 Digit ZIP's
Scale
0 2 4 6 8

Appendix F


Total Incoming Calls : 10/26/98-11/01/98
Legend: Colors & Symbols
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday
Answered
Busy
No Answer
Unknown
Medicine La
Falcon Heights
Minneapolis
Wayzata
Woodland
St. Louis Park
Minnetonka
Hopkins
St. Paul
Deephaven
4921 Columbus Av S
Lilydale
West St. Paul
Edina
Mendota Heights
Mendota
South S
Richfield
Sunfish Lake
10340 VIKING DR
Eden Prairie
Bloomington
Eagan
Inver Grove Hei
Burnsville
Shakopee
Savage
Apple Valley
Map Features
Call Details
Freeways
Cities
Scale
0
2
4
6
8

Appendix G